

### Abstract of the Disclosure

A repeater and method for an ATSC terrestrial digital TV broadcasting service. The on-channel repeater includes: a  
5 receiving unit for receiving a Radio Frequency (RF) broadcast signal from a main transmitter; a frequency downlink converting unit for converting the received RF broadcast signal into an intermediate frequency (IF) signal; a demodulating unit for converting the converted IF signal into  
10 a baseband signal; an equalizing unit for removing noise and multi-path signals generated from the converted baseband signal; a modulating unit for converting the baseband signal into an IF signal; a frequency uplink converting unit for converting the IF signal into a RF broadcast signal; a high  
15 power amplifying unit for amplifying and repeating the converted RF broadcast signal; a transmitting unit for transmitting the RF broadcast signal outputted from the high power amplifying unit; and a signal synchronizing unit for generating the first reference frequency, and generating the  
20 second reference frequency based on the first reference frequency such that the transmission/reception signal are frequency-and-phase synchronized.